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April 5, 2007

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
12th Street Lobby, TW-A325
Washington, D.C. 20554

Re: ***Ex Parte Communication,*** **PS Docket No. 06-229, WT Docket Nos. 06-150, 06-169, 07-16 & 96-86**

Dear Ms. Dortch:

Enclosed for filing in the above-captioned proceedings please find an *ex parte* submission "Principles for Enhancing Public Safety Telecommunications Capabilities." This paper sets forth important principles and specific criteria that Congress and the FCC can use to evaluate proposals for public safety spectrum allocations.

Pursuant to Section 1.1206 of the Commission's rules, a copy of this letter is being filed via ECFS with your office. Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Harold Furchtgott-Roth

Furchtgott-Roth Economic Enterprises
1200 New Hampshire Avenue, Suite 800
(202) 776-2032

cc: Chairman Kevin Martin
Commissioner Michael Copps
Commissioner Jonathan Adelstein
Commissioner Deborah Taylor Tate
Commissioner Robert McDowell

Principles for Enhancing Public Safety Telecommunications Capabilities

Harold Furchtgott-Roth[1]

April 2007

Background and Executive Summary

Over the past two decades, our federal government has undertaken efforts to improve public safety telecommunications capabilities. These efforts have included expanding the means for the public to reach public safety services (e.g., improvements in E-911 capabilities, both for wireline and wireless services) as well as improving the means for the internal communications structure of public safety organizations, particularly tactical wireless telecommunications. These efforts have taken on greater urgency after 9/11 and the revelations of weaknesses in the public safety communications systems.[2]

Although substantial concerns remain for public safety communications equipment, software, training, and funding, substantial federal attention, both before and after 9/11, has focused on finding more spectrum for use by state and local public safety organizations. As part of the Balanced Budget Act of 1997, Congress instructed the FCC to allocate 24 MHz of spectrum in the 700 MHz band to public safety. In 2002, the FCC allocated 50 MHz of spectrum at 4.9 GHz for public safety broadband services.[3]

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[1] President, Furchtgott-Roth Economic Enterprises. I gratefully acknowledge the underwriting of this paper by CTIA. The views expressed in this paper are my own and do not necessarily reflect the views of CTIA or its members.

[2] See *9/11 Commission Report*, particularly at 396-397.

[3] The 4.9 GHz Band Transferred from Government Use, *Second Report and Order and Further Notice of Proposed Rule Making*, WT Docket No. 00-32, FCC 02-47 (rel. February 27, 2002).

Despite these substantial new allocations,[4] both Congress and the FCC have recently considered various proposals for additional allocations and assignments of spectrum for public safety purposes.[5] Both Congress and the FCC will likely receive additional proposals for public safety spectrum in the coming months. Some proposals from private parties involve novel sharing of spectrum assignments, conditional availability of commercial spectrum to public safety organizations, and even conditional availability of public safety spectrum to commercial licensees.

This paper proposes three principles to use in evaluating these and other proposals for allocations of spectrum for public safety:

- New programs for public safety spectrum should be consistent with existing laws;
- New programs should unambiguously promote public safety communications capabilities; and
- New programs should not reduce the efficient operation of the commercial wireless industry and the remainder of the economy.

With these three broad principles as a foundation, this paper presents 22 specific criteria that could be used by Congress or the FCC in assessing new proposals for public safety spectrum. Recent proposals for incremental spectrum for public safety do not appear to meet some or all of the three principles or the 22 specific criteria.

[4] Much of the 700 MHz allocation has yet to be reassigned to public safety.
[5] Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Throughout the Year 2010, *Ninth Notice of Proposed Rulemaking*, WT Docket No. 96-86, FCC 06-181 (rel. December 20, 2006).

I. New programs for public safety spectrum should be consistent with existing laws

In evaluating a new proposal for public safety spectrum, Congress and the FCC should consider the consistency between the proposal and existing law. Below are six topics on the consistency of new public safety proposals with existing laws:

- The Commission cannot reassign for commercial use spectrum statutorily allocated for public safety use;
- Mutually exclusive commercial license applications require an auction;
- Public safety license assignments should be assigned based on public safety considerations and not unrelated commercial considerations;
- Vague concepts of determining the priority status of public safety spectrum may be unlawful;

The federal government cannot lawfully delegate to a non-governmental entity the assignment of public safety spectrum;

- Proposals for public safety spectrum should be consistent with the 2005 Deficit Reduction Act; and
- Proposals for new public safety spectrum programs should be consistent with current programs for public safety.

The Commission cannot reassign for commercial use spectrum statutorily allocated for public safety use The Commission has received some proposals for public safety spectrum that would make available public safety spectrum for the development of a commercial licensee. The exact circumstances under which a commercial licensee could use public safety spectrum vary by proposal, but in each instance some spectrum allocated for public safety use would be available for commercial development. Much

public safety spectrum, including 24 megaherz in the 700 megaherz band, has been allocated by statute for public safety. The Commission likely does not have the authority to reassign public safety spectrum for other purposes including commercial development.

Criterion 1: The legality of proposals for assigning rights for access and development of public safety spectrum to commercial licensees should be carefully reviewed.

Mutually exclusive commercial license applications require an auction.

Even if it were lawful for the Commission to assign rights for access and development of public safety spectrum to commercial licensees, the Commission must assign those licenses in a lawful manner. These commercial development opportunities presumably have commercial value and, if the federal government were to assign such rights, more than one entity would likely seek that commercial opportunity. Under Section 309 of the Communications Act of 1934, where there are mutually exclusive applications for licenses, the FCC should assign licenses by auction.[6] The FCC has auctioned spectrum rights even for secondary assignments. Some of the new proposals for public safety spectrum involve novel assignment techniques that would assign valuable spectrum rights for commercial use without an auction. The FCC does not have such authority.

Criterion 2: The legality of proposals for assigning rights to FCC licenses outside of an auction should be carefully reviewed.

[6] 47 U.S.C. § 309(j).

Public safety license assignments should be assigned based on public safety considerations and not unrelated commercial considerations.

In some instances, private parties have proposed to the FCC to offer with their commercial licenses special services to public safety in exchange for unrelated regulatory considerations to benefit commercial operations. Private parties clearly have the prerogative to negotiate, even with the government, for commercial advantage. But it is unclear how the FCC can assign spectrum for public safety use--or establishes priority of use for public safety--as part of an unrelated commercial spectrum proceeding.

Criterion 3: The legality of proposals for assigning public safety rights as part of the regulatory treatment of commercial licenses should be carefully reviewed.

Vague concepts of determining the priority status of public safety spectrum may be unlawful.

Proposals for the sharing of spectrum between public safety and commercial users potentially raise three types of coordination: coordination between public safety and commercial users; coordination among public safety users; and coordination among commercial users.

The coordination of spectrum between public safety and commercial users is usually handled based on exclusivity for public safety or different priorities of usage. If public safety users had primary usage of a spectrum band, there would likely be little need for coordination between public safety and commercial users. The commercial users would simply have secondary status. Some of the proposals for the sharing of

spectrum between commercial users and public safety users would require complicated mechanisms to determine which users would have priority of use under various circumstances. The details of such sharing proposals between public safety and commercial users should be detailed in advance of any government consideration.

The issues of coordination of spectrum among public safety users and among commercial users are more straightforward problems to solve. The coordination among public safety users is a governmental function with no plausible commercial role. The coordination among commercial users is quite likely a commercial function.

Some proposals may shift priority to public safety during emergencies, but there are no clear mechanisms for designating emergencies by geography or range of spectrum. Typically, designations of emergencies and shifting priorities of use are governmental functions. Current law gives those responsibilities to the Office of Science and Technology Policy for national emergencies, rare events.[7] But practically all public safety institutions respond to emergencies on a daily basis in localized geographic areas.

Government agencies can and do vary the priority of assignments by predictable criteria such as channels within spectrum, geography, and even time of day. Thus, for example, the same AM radio channel is assigned to different licensees geographically, and even within the same geography, a channel may be assigned to different licensees during different parts of the day. But these assignments are based on predictable long-term licenses, not reassignments based on emergency conditions. Although there are certainly instances where national government agencies take control of spectrum during emergencies and displace other users, these are typically ad hoc events, not formalized

[7] 47 C.F.R. § 202.3 (c)(2) (2004).

shifting of priority status.[8] These decisions are made by national governmental agencies, not delegated to private or quasi-private entities. On a normal operating basis, government agencies do not vary the priority of assignments based on unpredictable events such as local emergencies.

Criterion 4: The legality of proposals for reassigning the priority of usage between public safety and commercial users should be carefully reviewed.

The federal government cannot lawfully delegate to a non-governmental entity the assignment of public safety spectrum.

Some proposals for pubic safety spectrum suggest delegating the authority to assign public safety spectrum to a non-governmental entity. Such a delegation of authority may not be lawful. Our government divides allocations of spectrum between a "federal table" and "non-federal table."[9] The federal table is administered by the National Telecommunications and Information Administration, and the non-federal table is administered by the FCC.[10] Public safety spectrum, other than for federal agencies, is assigned by the FCC under the non-federal table.

The FCC, not private entities, is responsible for assigning spectrum on the non-federal spectrum table. Government agencies can and do delegate the final assignment of spectrum rights to sub-government agencies that have been delegated control of broad swaths of spectrum. For example, the federal government delegates to various regional planning committees (RPCs) the assignment of spectrum to local public safety agencies.

[8] 47 C.F.R. § 64 Appendix B.
[9] 47 C.F.R. § 21.05.
[10] Ibid.

The FCC partitioned the country into regions, roughly corresponding to state borders and each region has 800 MHz and 700 MHz RPCs.[11] But the federal government does not delegate to sub-government agencies, much less to private entities, the distribution of assignments of spectrum rights between private and public entities.

Criterion 5: Determine whether proposals for public safety spectrum retain governmental control over the assignment of spectrum.

Proposals for public safety spectrum should be consistent with the 2005 Deficit Reduction Act.

Under the 2005 Deficit Reduction Act, the FCC is instructed to assign by auction 60 megahertz of spectrum in the 700 MHz band by the first quarter of 2008.[12] Net receipts to the federal treasury from this auction have been scored by the Congressional Budget Office at more than $10 billion.[13] Some recent proposals for public safety spectrum would reassign for other purposes some or all of the 60 MHz of spectrum at 700 MHz and would either preclude the statutory auction or substantially reduce its likely receipts.

Further, the 2005 Deficit Reduction Act has a provision that instructs the NTIA to distribute $1 billion earmarked from the 700 MHz auction receipts for enhancing the interoperability of telecommunications services between public safety organizations.[14] Moreover, NTIA has the authority to begin borrowing the $1 billion from Treasury for

[11] See http://www.fcc.gov/Daily_Releases/Daily_Business/2006/db1006/DA-06-2003A1.pdf and http://pscc.state.wy.us/spectrum.html.
[12] Deficit Reduction Act of 2005, Pub. L. No. 109-171, 120 Stat. 4 (2006).
[13] CBO Cost Estimate, S. 1932, Deficit Reduction Act of 2005 at 21-22 (Jan. 27, 2006).
[14] Deficit Reduction Act of 2005, Pub. L. No. 109-171, § 3006.

this purpose beginning with fiscal year 2007, which began October 1, 2006.[15] Some recent proposals for public safety spectrum would endanger the 700 MHz auction and perhaps with it the $1 billion for public safety.

Criterion 6: Determine whether a proposal for public safety spectrum is consistent with the 2005 Deficit Reduction Act.

Proposals for new public safety spectrum programs should be consistent with current programs for public safety.

Some of the recent proposals for public safety spectrum are not based on existing governmental programs. The Administration and independent agencies have implemented statutes to help the public safety community without public-private sharing of spectrum. The federal government already has in place governmental mechanisms to coordinate spectrum and other telecommunications assets in times of emergency.[16] These include coordination of wireless assets including networks and spectrum.[17] These procedures do not involve the delegation to non-governmental entities of any decision-making authority. The CommTech program of the National Institute of Justice has a mission to assist state and local law enforcement agencies to communicate with one another.[18]

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[15] Ibid.
[16] For a list of statutes, rules, and executive orders governing telecommunications coordination under emergencies, see http://www.fcc.gov/hspc/legaldocs.html.
[17] See 47 C.F.R. § 214.
[18] CommTech program of National Institute of Justice, available at http://www.ojp.usdoj.gov/nij/topics/commtech/about.htm.

In recent years, the FCC has taken several steps to enhance the telecommunications capabilities of public safety organizations. These steps include:

- The Nextel spectrum swap clearing substantial spectrum at 800 MHz for public safety;[19]
- Acceleration of the digital television transition to expedite the availability of the 24 MHz of public safety spectrum;[20]
- Acceleration of the 700 MHz auction to expedite receipt of funds earmarked for public safety; [21] and
- Creation of an entire bureau dedicated to public safety and homeland security.[22]

All of these programs presumably promote public safety. New programs should not undermine these efforts.

Criterion 7: Neither Congress nor the FCC should adopt proposals for public safety spectrum that are inconsistent with existing statutes or rules.

II. New programs should unambiguously promote public safety communications capabilities

If a public safety spectrum proposal were lawful under the analyses recommended in Section I, such a proposal to be useful should directly benefit public safety. Some

[19] Improving Public Safety Communications in the 800 MHz band, *Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, Order,* WT Docket 02-55, FCC 04-168 (rel. August 6, 2004).
[20] Deficit Reduction Act of 2005, Pub. L. No. 109-171, § 3002.
[21] Deficit Reduction Act of 2005, Pub. L. No. 109-171, § 3003(a)(2).
[22] See Public Safety & Homeland Security Bureau, available at http://www.fcc.gov/homeland/.

proposals could result in the public safety community losing some or all of the $1 billion earmarked for interoperability from the FCC's 700 MHz auction under the 2005 Deficit Reduction Act, a difficult hurdle to surmount in demonstrating a benefit to public safety. Some of the proposals for expanding public safety spectrum promote public safety benefits only through the sharing of spectrum with commercial users with potentially unanticipated problems. This section reviews several topics to help assess whether a spectrum proposal will promote public safety:

- Many government agencies other than public safety are security-sensitive;
- Public safety requires many wireless capabilities;
- Public safety spectrum likely requires primary assignments;
- The likelihood of interference and interception harms public safety communications;
- Some spectrum sharing proposals may require special technology to shift priority status in real time;
- Spectrum sharing requires special network equipment and handsets; and
- Congressional precedents separate allocations of spectrum for public safety.

Many government agencies other than public safety are security-sensitive.

On the federal table of spectrum, NTIA assigns spectrum to security-sensitive federal agencies including the Department of Defense and the FAA. Practically all security-sensitive government agencies have spectrum allocations on the federal table, with the exception of public safety organizations. These organizations are primarily state

and local—rather than federal—agencies, and therefore they receive allocations from the FCC.

Security-sensitive government agencies have distinct assignments of spectrum because reliance on commercial or other non-secure services would undermine security concerns. Of course, not all wireless services used by public safety organizations—or the military, for that matter—require unusual security measures. Simple administrative communications services may not require high levels of security. For these and other services that do not require security, shared spectrum or even commercial arrangements may be sufficient for public safety organizations. Indeed, there may be no need for separate spectrum allocations for these purposes and no need for priority use during crises. Commercial wireless services are competitive and offer a wide range of services many of which are likely available and useful for administrative purposes for public safety organizations. But for tactical operations and other security-sensitive operations, commercial services and commercial spectrum likely are inappropriate. Similarly, shared spectrum may pose challenges for public safety organizations much as they would for the military and other security-sensitive government organizations.

Some of the recent proposals for the sharing of spectrum between commercial and public safety users are only being considered because the FCC controls the spectrum for both commercial and public safety users. Administratively, these spectrum-sharing proposals could not as easily be arranged between commercial and other federal users such as the military or the FAA because neither the FCC nor the NTIA could by itself regulate such spectrum sharing; the two agencies would have to coordinate such regulation, a daunting undertaking.

From the perspective of security, the sharing of spectrum between commercial users and public safety organizations is no less problematic than sharing between commercial users and the military. Yet there have been few if any serious proposals for new innovations in sharing spectrum between the military and other users including commercial operators. Perhaps the absence of such proposals merely reflects administrative difficulties, or perhaps it also reflects potential security concerns with the sharing of military spectrum.

Criterion 8: Determine whether a proposal to share spectrum between public safety organizations and commercial operators would be equally well received from a security perspective if the proposal involved the military and commercial operators.

Public safety requires many wireless capabilities

Even if a proposal for public safety spectrum were lawful, it would be useful to evaluate whether the proposal would enhance specific capabilities of public safety organizations. Municipal, county, and state governmental organizations provide police, fire, emergency medical, and other services to the public. These public safety organizations rely on communications for a variety of capabilities including:

- notification of emergencies;
- dispatch of crews to emergency locations;
- coordination of crews of the same public safety organization from headquarters;
- entering information from the field;
- accessing technical information from the field;

- tactical coordination at an emergency location of crews from different and from the same public safety organization; and
- detection and surveillance of threats to public safety.

Public safety organizations use both wireline and wireless services to meet their communications requirements. These organizations also have budgets and staffs dedicated to public safety activities. The staffs procure equipment, maintain equipment, develop operational protocols for the use of equipment, train personnel in the use of equipment, and take necessary steps to ensure that adequate communications services are available.

For decades, the wireless services of these organizations have relied in part on public safety mobile radio spectrum allocated by the Federal Communications Commission. Currently, public safety spectrum consists of approximately 73 MHz of spectrum, and that allocation will expand by 24 MHz with the return of the 700 MHz broadcast spectrum and with an additional 2.5 MHz of spectrum with the rebanding of the 800 MHz band. [23]

- Twenty-five years ago, the wireless capabilities of public safety organizations were no worse and often better than those available to commercial users. Today, the relative capabilities of commercial and public safety wireless service have changed. Now, more than 230 million commercial wireless users in the United States have a wide range of services. These commercial services are rapidly expanding, and their prices are often falling. Although greater than ever before, the wireless capabilities of public safety organizations have not necessarily kept

[23] For a good summary description of public safety spectrum allocations, see L. Irving and M. D. Gallagher, "21st Century Communications Systems for First Responders: The Right Call," 2006.

pace with the rapid advancement in wireless technologies available to the commercial sector.

No longer just a means to support public safety organizations, wireless communications have become a battleground in the war against terrorism. Consequently, public safety organizations today are partly responsible for protecting wireless communications networks and detecting harmful activities on those networks.

Public safety organizations today face daunting challenges in providing public safety services, in protecting their communications systems from interference and interception, and in monitoring and disabling threats to public safety. Useful proposals for new public safety spectrum should predictably enhance public safety capabilities. Some proposals for new public safety spectrum may not necessarily result in increased public safety capabilities.

Criterion 9: Identify specific wireless capabilities that would be enhanced by a spectrum proposal for public safety.

Public safety spectrum likely requires primary assignments

Even if a proposal for public safety spectrum were lawful, it is important to determine whether the proposal would actually lead to incremental spectrum for public safety and whether public safety assignments would have priority relative to other users in the band. Although the demands for public safety spectrum are substantial, meeting those demands is not simply a matter of purchasing more equipment for public safety

organizations and letting them use the equipment at will. Legal restrictions, rather than physical properties, limit usage of much of the electromagnetic spectrum, which collectively can be described as regulated spectrum.[24] To take a transmitter and transmit (or a receiver and receive) signals without authorization could cause substantial harms to others including the following:

- Interference with the lawful use of the spectrum by other individuals and consequent harms; and
- Unauthorized interception of lawful use of the spectrum by other individuals and consequent harms.

To avoid these and related problems, governments through the International Telecommunications Union (ITU) have developed an elaborate but predictable system for the lawful use of regulated spectrum. This system has three steps:

- ITU allocation of spectrum for specific uses in three geographic zones of the world. These allocations may have both *primary* and *secondary* allocations. Primary users may use the spectrum within an allocated band for specified purposes and are protected from specific levels of noise and energy emission. Secondary users may use the spectrum within an allocated band for specified purposes only to the extent that they do not interfere with other users within the band. Secondary users have no protection from interference by primary users. No user of spectrum may interfere with usage in other bands of spectrum.
- Consistent with the ITU allocations, more detailed allocations of spectrum by national governmental authorities, both for primary and secondary usage.

[24] Everyone freely uses much of the electromagnetic spectrum for visible light and spoken communications. The regulated portions of the spectrum are generally between 9 kHz and 275 GHz. See, e.g., FCC Online Table of Frequency Allocations, 47 CFR § 2.106 (Nov. 29, 2006).

National governments may and do provide greater precision for interference protection for primary users;

- Consistent with the national allocations, specific assignments of usage to individuals or other spectrum users. National authorities may assign spectrum to both primary and secondary users within primary allocations; all assignments within secondary allocations have secondary status.

There are at least 6 different statuses for spectrum assignment:

- *Unqualified primary status* Licensees are permitted to use spectrum subject to noise and emission restrictions and legally protected from interference above a certain noise and energy level.
- *Primary status conditional on a specific circumstance* Licensees are permitted to use spectrum subject to noise and emission restrictions, but only under the specified condition is it legally protected from interference above a certain noise and energy level; otherwise it has secondary status.
- *Secondary status conditional on a specific circumstance* This status can be the reflexive part of conditional primary status above. Alternatively, a licensee may never have primary status but can have different degrees of secondary status conditional on various factors.
- *Unconditional secondary status* This is a common status. The licensee can use spectrum within a band but has no protection from interference from primary users.

- *Unlicensed usage* In various bands in the United States, licenses are not required for usage. Rules describe the permissible types of signals and energy levels, but users have no protection from interference from other users.
- *Software defined radio* For SDR, software enables equipment to transmit and receive in relatively underused bands of spectrum. Typically, SDR applications are unlicensed and not restricted to a specific band.

Table 1 presents the effect of each license priority status under six different conditions relevant to public safety uses. Notice that only primary assignments have an unambiguously priority status under all conditions. The conditional assignments have the additional burden of depending circumstances and official determinations that those circumstances are present. Some of these conditions are quite important to public safety. For example, the unavailability of priority status for training would substantially limit the effectiveness of public safety wireless services.

Table 1

The Effect of the Priority of Spectrum License Status on various circumstances relevant to public safety

	Detected interference always unlawful	Interference never the result of ambiguous rules or circumstances	Interceptions never the result of ambiguous rules or circumstances	Priority status independent of circumstances	Priority status for training	Priority status during crises
Unconditional primary	Yes	Yes	Yes	Yes	Yes	Yes
Primary conditional on specific circumstance	Sometimes; depends on circumstances	No	No	No	No	Sometimes; depends on circumstances
Secondary conditional on specific circumstance	No	No	No	No	No	No
Unconditional secondary	No	No	No	No	No	No
Unlicensed	No	No	No	No	No	No
Software defined radio	No	No	No	No	No	No

Table 1 reveals substantial advantages to public safety organizations from unconditional primary assignments of spectrum. Table 1 does not reflect all of the advantages that primary licenses have for public safety even outside of crises. Primary status for daily operations reinforce training and readiness of public safety providers. Moreover, imprecision in determination of "crisis" conditions can leave public safety without spectrum during near-crisis conditions. Secondary status also means that network architectures may be optimized for commercial rather than public safety needs.

Table 1 does not reflect all of the advantages that primary status licenses have during a crisis. As seen during the 9/11 crisis and Hurricane Katrina, demand for all forms of wireless services expand during a disaster while the availability of those services may be degraded. Both the expanded demand for wireless services and the reduced availability of those services mean the likelihood of secondary users having

access to spectrum declines. Correspondingly, the attractiveness of secondary assignments declines.

In a competitive market, resources are allocated based on a willingness to pay. The more an individual is willing to pay for a resource, the more likely the individual will receive the resource. In our economy, the vast majority of resources are controlled by commercial interests, and those interests would likely be willing to pay substantially more for wireless services and spectrum during a crisis than public safety organizations. For public safety to receive additional spectrum during a crisis, spectrum must be assigned by a means different from willingness to pay. The clearest and simplest means of that assignment is to grant public safety priority status.

Criterion 10: Examine the assignment of licenses for public safety organizations, and the priority status of those licenses, under proposals for public safety spectrum.

The likelihood of interference and interception harms public safety communications

If channel assignment protocols are not properly respected, the losses to rightful users are substantial. Interference can reduce the quality of, and even disrupt, valuable communication. Interception of a commercial communication violates the privacy that a user reasonably expects. But the consequences of interference and interception are much greater for public safety communications. Interference of public safety communications can disrupt public safety operations leading to substantial loss of property, health, and even life. Interception of public safety communications can endanger the security of public safety operations, again imperiling property, health, and even life.

The *9/11 Commission Report* reviews deficiencies in public safety communications during the crisis.[25] It recommends Congressional action in areas that were ultimately included in the 2005 Deficit Reduction Act.[26] The *9/11 Commission Report*, however, does not mention public-private partnerships as a means to improve public safety communications, perhaps with good reason.

As seen during the 9/11 attack, crises create peak demand not only for public safety communications but for commercial communications as well. The sharing of spectrum between public safety and commercial operators could lead to a shortfall for one, the other, or both during a crisis, and must be factored in as part of the consideration of joint use. This shortfall would be exacerbated by a decision to shift the primary status for the spectrum during a crisis.

The sharing of spectrum, if not done with great care, could facilitate individuals' intent on either interfering with or intercepting public safety communications. The sharing of spectrum could make more difficult the detection of, and response to, such activities.

Criterion 11: Examine the likelihood of interference and interception of public safety communications under a proposal for public safety spectrum.

[25] *9/11 Commission Report* at 396-397.
[26] Ibid at 397.

Some spectrum sharing proposals may require special technology to shift priority status in real time.

Some public safety proposals may shift priorities of usage or assignments during a crisis. Even if such a proposal for spectrum sharing within a band had the following characteristics:

- Lawful,
- Greater wireless capabilities for public safety,
- Primary status for public safety, and
- Less likely interference and interception,

there still would remain the issue of whether the technology for reassigning priority status or assignments to implement the proposal is commercially available. Both public safety and commercial licensees within a band to be shared would depend on real-time assignments of priority status by time and geography. Even if the software were available, there still would be issues about which agency (presumably a governmental agency) would maintain and upgrade the assignment software, and how reassignment of priorities would be signaled to licensees.

Even if the relevant equipment and software is commercially available, coordination would be necessary to ensure the following:

- <u>All public safety and all commercial licensees within the band must use equipment and software that coordinate with one another.</u> This will require a substantial degree of technical, acquisition, and financial coordination among public safety and commercial licensees. Simply selecting technical standards for the band could take years. Even once a standard is set, the acquisition of network

and handset equipment must be coordinated among public safety and commercial licensees to ensure that all licensees are using the same standards at the same time.

- Any software or equipment upgrades to the system must happen simultaneously. Technology for network and handset equipment and software constantly improves. Sharing of spectrum will only work with close coordination of upgrades to equipment and software.
- No equipment ungoverned by the priority-shifting mechanism can be used. This is a particular challenge for mobile hand sets to ensure that they do not interfere when a different licensee has priority within a band. A band of spectrum may be assigned for commercial mobile radio services in many countries. The services deployed for commercial licensees in the United States in a band shared with public safety would likely be similar to those services available in other countries in that band with the exception of the public safety spectrum sharing provisions. Care must be taken to ensure that handsets that operate in that band and that are issued in other countries do not interfere with public safety when roaming in the United States. Such a restriction would obviously limit the commercial attractiveness of the spectrum.

Criterion 12: For proposals that depend on shifting priority of assignment during emergencies, determine whether the priority assignment technology is commercially available and determine whether the means for governmental coordination within the spectrum are available.

Congressional precedents separate allocations of spectrum for public safety.

Historically, Congress has favored separate allocations of spectrum to public safety with good reason. Congress has passed several laws to authorize wireless telecommunications services for public safety organizations and to facilitate coordination of wireless services particularly during emergencies.[27]

Given the results of Table 1, it is not surprising that Congress usually relies on primary assignments, rather than other forms of assignments, to military and public safety users. Most military and public safety spectrum is not subject to the vagaries of conditions for priority of status. Interference and interception of public safety and military communications is unlawful and usually intentional, and more easily detected than it would be if spectrum were shared. Primary use of spectrum also facilitates equipment purchases and training. Primary assignments of spectrum also facilitate public safety and military use during times of crisis. There are no needs for additional assignment decisions to be made.

Criterion 13: Determine whether a public safety spectrum proposal is consistent with Congressional precedents offering primary status to public safety spectrum.

[27] Coordination of spectrum during emergencies is discussed at 47 U.S.C. § 308 and 47 U.S.C. § 606.

III. New programs should not reduce the efficient operation of the commercial wireless industry and the remainder of the economy

The commercial wireless industry serves more than 230 million customers and contributes more than $92 billion to the U.S. economy.[28] Further, commercial wireless services help fight against terrorism. During the 9/11 terrorist attacks, commercial wireless networks were used to thwart terrorist activities. Commercial wireless communications alerted passengers on Flight 93 to the true nature of the terrorist attacks. Yet terrorism also weakens commercial wireless services. In the aftermath of the destruction of the World Trade Center, commercial wireless services in Manhattan and other parts of the country were insufficient to meet demand.

Legality and enhancement of public safety capabilities are necessary but not by themselves sufficient for a public safety spectrum proposal to be valuable. A useful proposal should also do no serious harm to the remainder of the economy, particularly the commercial wireless industry.

Some simplistic solutions that might help public safety could have disastrous effects on the commercial wireless industry. Extreme examples include: (1) to reassign all commercial spectrum for public safety use at least on a secondary basis; and (2) to require commercial operators to set aside certain facilities and capabilities for public safety purposes. Other proposals, while less extreme, may still inadvertently result in substantial harm and reduced efficiency to the wireless industry and the rest of the economy.

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[28] Competition and Convergence: Testimony of Steve Largent before the U.S. Senate Committee on Commerce, March 30, 2006, available at http://policycouncil.nationaljournal.com/NR/rdonlyres/84BEE3B3-6A90-40D9-9F4A-18559575703C/35337/SLFINAL12.pdf.

- A system of subsidies that favors one individual commercial carrier or a small group of carriers would harm the competitive commercial wireless industry;
- In the competitive commercial wireless industry, carriers cannot efficiently cross-subsidize public safety services with revenues from commercial services;
- In competitive markets, the government need not subsidize incumbency or entry;
- Public safety organizations value the opportunity to select from among different vendors;
- Wireless carriers value the opportunity to offer a range of services to any potential customers;
- Priority arrangements in one band of spectrum should be predictable and seamless;
- A bad policy in one band of spectrum establishes a precedent for other bands of spectrum;
- The 700 MHz auction should not be adversely affected; and
- The rights and responsibilities of licensees should not be adversely affected.

A system of subsidies that favors one individual commercial carrier or a small group of carriers would harm the competitive commercial wireless industry.

Some proposals for public safety spectrum call for subsidies or special considerations to one or more commercial wireless carriers in exchange for assistance in providing spectrum or other services for public safety organizations. Although it is perfectly reasonable for a government and a private party such as a wireless carrier to

negotiate for the provision of services, there is no reason for the federal government to interfere with the smooth and efficient operation of the commercial wireless industry.

Without governmental subsidies, commercial wireless services are currently ubiquitous throughout some of the United States and are available at competitive rates. With few exceptions, new governmental programs to subsidize individual wireless carriers would neither expand the scope of available commercial services nor reduce prices. It is difficult to see any public benefit in terms of new service offerings or lower prices as a result of a new governmental program to create subsidies for commercial wireless carriers to enhance public safety wireless capabilities.

The usual economic conditions for government intervention in a market are the presence of public goods, externalities, or other market imperfections.[29] These conditions provide a foundation for government support for public safety organizations with general revenues and other considerations. But economic logic does not support intervening either in competitive wireless markets or for spectrum. Markets for those services are competitive.[30] The most efficient way for the government to provide those services to public safety organizations is to pay for them in competitive markets in much the same way the government procures competitively-provided automobiles, office furniture, computer equipment, and other equipment and services.

[29] See Samuelson, Paul, *The Pure Theory of Public Expenditure*, Review of Economics and Statistics 36(4) (1954). See Pigou, A.C., *The Economics of Welfare* (4th ed. 1932).

[30] Businesses can and do lease spectrum. See Wireless Telecommunications Bureau, Spectrum Leasing, at http://wireless.fcc.gov/licensing/index.htm?job=spectrum_leasing. Leased spectrum, however, may be inappropriate for security-sensitive services for the same reason that shared spectrum is inappropriate.

Criterion 14: Determine whether a public safety spectrum proposal would require specialized government action beyond simple purchase of services at market rates for wireless services or spectrum.

In the competitive commercial wireless industry, carriers cannot efficiently cross-subsidize public safety services with revenues from commercial services.

Some proposals for public safety spectrum may require one or more commercial wireless carriers to cross-subsidize public safety organizations from commercial revenues. In a competitive industry, prices are set by market conditions rather than government regulation. Under these circumstances, a competitive firm cannot and will not cross-subsidize from competitive services to a non-competitive service no matter how worthy that service may be.

Criterion 15: Determine whether a public safety spectrum proposal would require a commercial wireless carrier to cross-subsidize public safety services.

In competitive markets, the government need not subsidize incumbency or entry.

Some proposals for public safety spectrum involve the federal government subsidizing the commercial entry of a firm into commercial wireless operations in exchange for assistance to public safety organizations. Although it is possible that in certain geographic areas for certain services, wireless may not yet be fully competitive, in most regions for most forms of service, the commercial wireless industry is quite

competitive. Under these circumstances, government subsidies for entry would be wasteful.

Criterion 16: Determine whether a public safety spectrum proposal would lead to government subsidies for entry into commercial wireless services.

Public safety organizations value the opportunity to select from among different vendors.

As part of some public safety spectrum proposals, some public safety organizations might be bound to use a specific commercial wireless carrier as a service provider for network and other wireless services. Without exclusivity as part of a contract, a wireless service provider might be unwilling to release spectrum or other services to a public safety organization.

Although some terms of the arrangement might be favorable to public service organizations, other terms and conditions might not be. Specifically, a commercial wireless carrier might reasonably configure its network and develop service offerings for commercial customers rather than for a public-safety organization that would not pay for incremental services or that would only pay discounted rates. Indeed, the structure of a sole-source contract could provide a commercial carrier with little incentive to provide responsive services to a public safety organization. Under a sole-source contract, a public safety organization could become a captive customer, unable to switch to a different provider with incentives to serve it better.

Criterion 17: Determine whether a public safety spectrum proposal would limit a public safety organization from choosing among competing wireless service providers.

Wireless carriers value the opportunity to offer a range of services to any potential customers.

Similarly, some proposals for public safety spectrum would bind one or more commercial wireless service providers to offer services or access to networks or to spectrum to public service organizations. By limiting the potential customer base for certain wireless services or spectrum to public safety organizations, these wireless carriers may not be able to develop more innovative and profitable opportunities with the same spectrum and services offered to other customers. Under a sole-purchaser contract, a wireless carrier could become a captive supplier, unable to switch to different customers with incentives to purchase more profitable services.

Criterion 18: Determine whether a public safety spectrum proposal would limit a wireless carrier from offering services to some customers.

Priority arrangements in one band of spectrum should be predictable and seamless.

Some proposals for public safety spectrum would shift the priority usage of spectrum during emergency conditions to public safety organizations. Local emergency conditions may vary frequently leading to localized priority of spectrum. Even if these priority assignments were lawful and technically feasible, such real-time changes in priority of assignments on a local level could interfere with the usual operation of the

commercial wireless industry. Today licensees have relatively clear and predictable understandings of the priority of spectrum assignments. Many commercial carriers can and do use different bands of spectrum for sophisticated wireless networks that operate under a variety of conditions but all with reasonable expectations of predictable priorities of spectrum. Should the priority of spectrum in one or more bands of spectrum become unpredictable particularly in each local geographic area, carriers might reasonably try to avoid those bands, reducing their commercial value.

Criterion 19: Determine whether a public safety spectrum proposal would lead to cumbersome and even unpredictable priority arrangements that would reduce the value of spectrum in a band.

A bad policy in one band of spectrum establishes a precedent for other bands of spectrum.

A sharing arrangement of spectrum between public safety and commercial licensees can only be authorized by the FCC. If the FCC has the authority to require sharing in one band of spectrum, it almost certainly has the authority to require sharing in other bands of spectrum.

A public safety proposal that could shift usage priority in one band of spectrum could easily be imitated in other bands of spectrum. The detrimental effect on the value of spectrum would not necessarily be limited to the initial band. Investors would reasonably assume that the uncertainty of priority in one band of spectrum could easily

infect other bands of spectrum as well. The value of commercial spectrum, both for transfer of licenses and for secondary lease markets, could be adversely affected.

Criterion 20: Determine whether a public safety spectrum proposal that would lead to unpredictable priority arrangements could be limited to one band of spectrum.

Scheduled auctions should not be adversely affected.

. Some of the proposals for public safety spectrum would affect the 700 MHz auction. By statute, the FCC is to auction in 2008 commercial licenses for broadband wireless services in 60 MHz of the 700 MHz band. The Congressional Budget Office has scored the auction receipts at more than $10 billion. Some of the proposals for public safety spectrum would use some of the 60 MHz designated for auction for public safety purposes.

Designating even a small part of the 60 MHz for other purposes could substantially reduce commercial interest in the band of spectrum and reduce potential receipts from auction participants. With 60 MHz of spectrum, two or three different carriers can realistically win licenses in any region and offer services. If some or all of the spectrum is designated for other purposes, fewer companies can realistically obtain licenses and offer meaningful services. Spectrum block sizes might be reduced as well. The net effect of taking away some of the 60 MHz of spectrum from the auction would be to reduce interest in the auction and reduce receipts along with it. Redesignating some of the 700 MHz spectrum for other purposes could undermine not only confidence in the

700 MHz auction itself, but potentially other auctions where the government might plausibly redesignate spectrum for other purposes.

Criterion 21: Determine whether a public safety spectrum proposal would reduce spectrum available for previously scheduled auctions.

The rights and responsibilities of licensees should not be adversely affected.

A public safety spectrum proposal that shifts priorities of assignments and that changes the outcome of a major auction may have other far-reaching consequences. These results undermine the concept that spectrum licensees have property rights. Instead, licensees merely have an asset at the leisure of the government, and the government can easily take it away. These concepts of reducing rights in one band of spectrum could undermine the value of all spectrum in other bands as well as investors would have little certainty that the government might not replicate the conditions elsewhere.

Criterion 22: Determine whether a public safety spectrum proposal would reduce the property rights of all spectrum licensees.